

is entirely lacking in the abundant series of shells sent by Garrett to conchologists. Yet at the present time the total area of its occupation extends over some miles of territory, in which the animals occur in greater numbers at the higher levels. From the observations of the present writer during the years from 1907 to 1923, it is certain that the species has spread into this wider territory from a central region that must have been so small in Garrett's time as to escape the scrutiny of that careful explorer and observer; in short, the condition of *P. mirabilis* some decades ago must have been like that of *P. tohiveana* and *P. olympia* at the present time, although *mirabilis* has extended its range and it has differentiated into diverse colonial associations as the other species have not as yet.

The full statement of the structural qualities and color-characteristics of *mirabilis* must await the complete analysis of the material now in hand, which comprises several thousand individuals. The data given in the foregoing account sufficiently define the species and indicate its noteworthy features.

EXPLANATION OF PLATE VI

- Figs. 1-4. *Partula tohiveana*, new species.
Figs. 5-8. *Partula olympia*, new species.
Figs. 9-13. *Partula dendroica*, new species.
Figs. 14-20. *Partula mirabilis*, new species.

A BUCKET DREDGE

BY CHARLES HEDLEY

I suppose that all zoologists who have worked in water deeper than a hundred fathoms have found trouble with their gear. Especially is this the case with people who, like myself, began to dredge without tuition or any help from experienced men. Sometimes a dredge returns without a spoonful of shells, although the polished metal certifies that it has been rubbed on the bottom. A dredge that goes overboard so neatly may return with the tail wrapped in the mouth or the wire rope may be twisted and tangled.

After many such disappointments, the writer planned to construct a fool-proof dredge, which should never fail to go down straight, to fill properly and finally to deliver a profitable load on deck. The instrument here described has fulfilled these requirements, working admirably in rough, very rough, weather.

FIG. 1

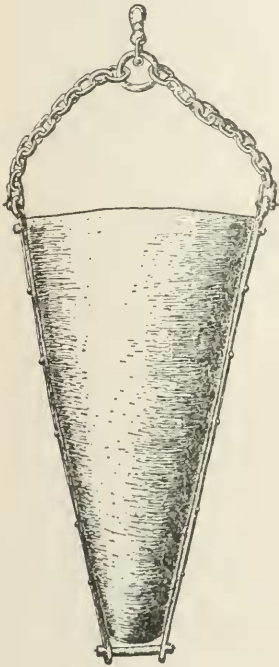
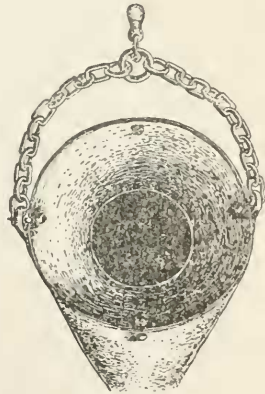


FIG. 2



Figs. 1, 2. Bucket Dredge, from the side and above.

Several American friends, to whom I related my experiences have asked for particulars. In the hope that the usefulness of this tool may be extended, I now offer to the readers of the "NAUTILUS" a sketch and description of my bucket dredge.

The dredge, which weighs altogether about forty pounds, is made of a sheet of 2-mm. steel rolled in a cone, 1000 mm. long, 410 mm. in diameter at the wide end and 100 mm. at the narrow end. This cone is stiffened by side straps of flat bar steel 7 mm. thick and 40 mm. wide. These project 50 mm. beyond

the small end to hold a 12-mm. bolt; outside this bolt and between the side straps is a "distance piece" which serves the double purpose of holding the side straps apart and of carrying a dredge or tangles. At the wide end the side straps project 50 mm. and are thickened into 18-mm. shoulders in order to carry the shackle bolt. A substantial chain attached to the latter serves to swing the dredge. The aperture of the dredge is choked with a cone-shaped flange, a moveable basin diaphragm, with an orifice of 200 mm. in diameter and set back 120 mm. within the periphery. By the rim it is fastened to the dredge with four nuts and bolts. The object of the flange is to save the contents from being washed out by swirling eddies as the dredge ascends.

One point that I stress for the zoologist, who is not an engineer, is the need for a strong swivel-link to be placed above the bucket. A bucket sent down to deep water without a swivel will not come home but will spin till the rope screws off and breaks.

For emptying the dredge the flange is removed and the sand or mud dug out with a trowel, the contents may be bagged up to take ashore. But if the voyage is a long one the catch can be treated aboard. For this I carry sieves small enough to be manipulated in an ordinary ship's bucket. These are 200 mm. in diameter, 100 mm. deep and have a wire net of 20 meshes to the inch. Finally when the mud is washed out, the product of the sieves can be tied up in small canvas bags, holding a couple of pounds or so, and dried in the engine room.

NOTES ON MARINE MOLLUSKS FROM PERU AND ECUADOR

BY A. A. OLSSON

In the course of geologic studies in Peru, opportunity was occasionally found for the collection of marine mollusks from the beaches along the northwest coast. Although these collections have not as yet been fully studied, it is believed that this preliminary account and list of the more common or otherwise interesting species may be of value. The collections begin